Minneapolis Comprehensive Plan
Tier II Sewer Plan Update

Combined Sewer Overflow Program - Phase 2

November 1, 2002

I hereby certify that this plan, specification, or report, was prepared by me or under my direct Supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

_____

Date_____ Registration No_____

Prepared by Public Works, Engineering Services

INTRODUCTION

November 1, 2002

NPDES/SDS Combined Sewer Overflow Permit

The 1972 amendments to the Federal Water Pollution Control Act (known as the Clean Water Act) provided the statutory basis for the National Pollutant Discharge Elimination System (NPDES) permit program designed to regulate the discharge of pollutants from point sources to waters of the United States. The Minnesota Pollution Control Agency (MPCA) has issued joint NPDES Combined Sewer Overflow (CSO) permits to the City of Minneapolis (City) and the Metropolitan Council (Met Council) since 1985. The most recent permit was issued on February 26, 1997 and expired on June 30, 2001. These permits regulate CSOs by stipulating procedures to follow in the event of an overflow from the sanitary system, efforts to eliminate these overflows, and reporting requirements for overflow events and elimination efforts. A separate interagency agreement between the City and the Metropolitan Council Environmental Services (MCES) details the responsibilities of each party with respect to operation of the collection system and notification in the event of an overflow from the sanitary system.

In Minneapolis, sewer separation began in the 1960s when the City began actively constructing storm drains in areas served by combined sewers in conjunction with it's residential street paving program. In 1986, the City began a sewer separation program supplemented with State and Federal funds (the CSO program now referred to as Phase 1) within the context of the first NPDES CSO permit issued jointly to the City and the Met Council. During the Phase 1 program, the City made tremendous progress in reducing CSOs by disconnecting more than 2,500 commercial and residential roof rainleaders from the sanitary systems, and separating over 4,600 acres of area previously served by combined sewers. Today around 96% of the City is served by separate storm drains, yet overflows although greatly reduced still persist. The City has recently embarked upon Phase 2 of CSO efforts, which is described in more detail later in this report.

Tier II Sewer Plan

Citing a need for coordinated plans, programs and controls by all local governmental units and school districts, the State of Minnesota enacted the Metropolitan Land Planning Act in 1976. This mandate gave the Met Council regional planning responsibility. In accordance with the regional plan then adopted by the Met Council, all cities and counties within the seven-county metropolitan area adopted a Comprehensive Plan comprised of programs, improvements and development strategies implemented to comply with the regional plan. The City of Minneapolis adopted its first Comprehensive Plan under this Act in 1982.

The current City of Minneapolis Comprehensive Plan includes as part of the public facility plan requirements, the 1999 Sewer Plan. This document is a sewer policy plan, classified as a Tier II Sewer Plan according to the content requirements in the Met Council's Local Planning Handbook (1998). The plan describes the sanitary sewer system history, features, and current problems; and provides projections of future sewage flows and schedules for improvements.

INTRODUCTION

November 1, 2002

Memorandum of Understanding

As part of the 2000 Minneapolis Comprehensive Plan approval by the Met Council, the City entered into an agreement with the Met Council to outline their joint and separate efforts to address Combined Sewer Overflows (CSO). This agreement, titled Memorandum of Understanding Relating to Combined Sewer Overflow Elimination Efforts (MOU), covered commitments by both parties:

- Joint application to the Minnesota Pollution Control Agency (MPCA) for renewal of the NPDES/SDS CSO permit
- Joint Infiltration and Inflow (I/I) study to identify sources of the CSO problem and recommend improvements for elimination
- Submittal by the City to the Met Council of an implementation plan for CSO improvements based on the joint study as part of the City's Comprehensive Tier II Sewer Plan
- Continuation of CSO efforts in the interim

This submittal now updates the Tier II Sewer Plan as well as serves to meet the requirement of the MOU for submittal of an implementation plan for CSO improvements based on the joint study completed in April 2002.

COMBINED SEWER OVERFLOW PROGRAM - PHASE 2

November 1, 2002

Goals and Strategy

The goal of the Minneapolis Combined Sewer Overflow Program - Phase 2 is to substantially reduce and hopefully eliminate combined sewer overflows at the remaining eight regulated locations (see table below).

Overflow Site Location	NPDES Permit Number	Responsible Party
39th Ave S & Minnehaha Pkwy	M001	MCES
38th St E & 26th Ave S	M002	MCES
Southwest Meters	M004	MCES
Northwest Meters	M005	MCES
East Meters	M006	MCES
26th St E & Seabury Ave	M007	MCES
Oak St & 5th St SE	M012	City
Portland & Washington Ave S	M020	MCES

These overflows result in the discharge of combined sewage and stormwater flows to the Mississippi River. The strategy that has been adopted to realize this goal is the implementation of a multiple-approach program. The foundation of this program is the recommendations made for improvements presented in the Combined Sewer Overflow Separation Evaluation Project (CSOSEP) Report. The recommendations to be implemented by the City of Minneapolis in the (CSOSEP) Report executive summary are as follows:

- Disconnect public sector inflow sources
- Disconnect private sector inflow sources
- Study & implement storage or conveyance improvements

The long-term goal means elimination of overflow structures wherever feasible without causing a public health or safety hazard. The immediate goal is, at a minimum, to meet or exceed the EPA's current sewer overflow control policy.

Program Description & Status

Interdepartmental Coordination – CSO Task Force

The CSO Task Force is an interdepartmental team assigned to direct and coordinate the work of the City's CSO program, and keep City officials and policymakers informed of relevant issues and necessary resources. This task force was instituted in early 2001 staffed by representatives of the City Attorney, Communications, Planning, Public Works, and Regulatory Services departments.

The primary objectives in the first year of operation were to establish a new CSO program and setup initial components, funding, and staffing. Fact sheets were distributed, and individual meetings and group presentations were conducted to prepare City Council members and department heads for planned budget requests and the scheduled introduction of a new rainleader disconnect ordinance. Budget requests were

COMBINED SEWER OVERFLOW PROGRAM - PHASE 2 November 1, 2002

made in 2001 for staffing along with overhead funding to begin in 2002. This budget request was subsequently approved, with part of the newly created positions filled by mid-2002. The remaining positions shall be filled in early 2003 to coincide with the start of the new Rainleader Disconnection Program. Budget requests have been made again in 2002 for additional staffing including overhead funding, special initiatives, and capital improvements to begin in 2003. The Mayor and the Capital Long-Range Improvements Committee (CLIC) have recommended this most recent budget request. It is presently under review by the City Council prior to final approval of the City's 2003 Budget and 5-year Capital Improvement Program (CIP). Detailed cost information is presented on page 9 of this report.

Rainleader Disconnection Program

The Rainleader Disconnection Program's (RDP) objectives are to complete the program of disconnection of rainleaders connected to the sanitary sewer system begun in 1985, and remove other private sources of inflow to the sewer system including parking lot and other stormwater drains citywide. The department responsible for this program is the Environmental Management division of Regulatory Services.

This program is now in development and scheduled for mobilization in early 2003. The critical piece of the RDP is the rainleader ordinance that has been drafted by Environmental Management. Internal review has been completed for this new ordinance which will soon be presented to City Council for adoption. Every property in the City shall then be inspected for illegal connections to the sanitary sewer system and previous disconnections that do not meet rainleader ordinance criteria. Inspection areas will be prioritized relative to coordination with construction projects, relative impact on overflows, and impact on area flooding problems. Property owners shall be ordered to meet code requirements for any connections found to be illegal or improper under the ordinance. RDP staff is also in the process of preparing permitting documentation and database support, ad hoc inspection area maps, and determining inspection procedures and criteria.

Engineering Services and Field Services of Public Works will provide assistance and technical support to the RDP as follows:

- Review inspection areas for known ponding or flooding problems to determine if solutions are planned or will be required to prevent creating or adding to localized flooding problems. Design and manage required capital improvement projects identified.
- Design and manage capital improvement projects needed to facilitate rainleader disconnects to provide system capacity and availability for new storm connections needed.
- Provide infrastructure information and field assistance in dye-testing operations.

City facilities with rainleaders or property drains connected to the sanitary sewer system shall be separated through the efforts of the Property Services division of Public Works which is responsible for project management and maintenance of City-owned property. An investigation of City facilities was completed in 2001 to identify separation work and estimate costs based on long-term plans for all facilities. An initial request was made in 2002 for funding late in the next 5-year CIP, but opportunities may exist to accelerate

COMBINED SEWER OVERFLOW PROGRAM - PHASE 2 November 1, 2002

this schedule. Funding will be reexamined before completion of schedules and facility designs.

Capital Improvements and Maintenance Program

This objective of this program is to identify and implement capital improvements and maintenance work that will most effectively eliminate or control public sources of inflow and infiltration, and support rainleader disconnections. The department responsible for this program is Minneapolis Public Works. The divisions of Public Works that will collaborate in this effort include Engineering Services, responsible for project management of capital infrastructure improvements and related studies; and Field Services, responsible for construction and maintenance of infrastructure.

The work needed to accomplish the goals of this program can be delineated as follows:

- Complete remaining combined sewer separation work known at this time (catch basin inlets and storm drains connected to sanitary system).
- Complete a City sanitary storage/hydraulic modeling study and implement recommended system improvements.
- Design and manage capital improvements needed to facilitate rainleader disconnects and prevent new or increased localized flooding problems due to rainleader disconnection.

Engineering Services and Field Services will work jointly to address separation work that was postponed or dropped from the CSO Phase 1 program of the mid-80's to late 90's. The remaining identified areas were generally difficult and more costly on a per acre basis to separate. Several of the projects were set aside, judging it would be better from a long-term planning and financial perspective to construct them in conjunction with future street renovation or flood mitigation projects, especially in light of the lack of federal and state funding for CSO projects.

All known separation areas are being reviewed in order to establish a prioritized list of capital projects and maintenance work. Rankings will be based on a combination of factors including coordination with other projects, cost per acre, relative impact on overflows, and impact on area flooding problems. Upon completion of this initial list, work will commence on designs and plans followed by construction and project management for the first year of projects in 2003. Creative alternatives will be considered to resolve some of the separations previously evaluated as not feasible or too costly.

A modeling study of the City's sanitary sewer system will identify system improvements utilizing storage, maximizing system capacity, and conveyance. A thorough understanding of the performance of the City's sanitary sewer system during wet weather is essential to controlling CSOs. Other cities who have attempted controlling CSOs have found the problem extremely challenging and persistent. An isolated improvement will often simply shift the problem to an adjacent area. Some communities have declared CSOs eliminated only to experience a reoccurrence of CSO or Sanitary Sewer Overflow (SSO) events during a significant rainstorm.

COMBINED SEWER OVERFLOW PROGRAM - PHASE 2 November 1, 2002

The creation and application of a sanitary system model study will greatly benefit controlling CSOs. It will provide a tool to:

- Identify system bottlenecks and local capacity deficiencies.
- Test improvements to optimize system capacity such as storage or rerouting of wet weather flows.
- Track down the source of unresolved inflow or infiltration problems.
- Help to evaluate more costly separation projects for effectiveness.
- Perform an effectiveness evaluation of constructed improvements (as recommended in the CSOSEP Report).

Recommended projects identified by this study and through the post-study use of the completed model by Engineering Services staff shall be added to the separation project list for inclusion in the CSO capital improvement projects schedule.

Public Education Program

The departments jointly responsible for this program are the Communications division of Public Affairs, and Environmental Management of Regulatory Services. Public Works Administration and Engineering Services supports this initiative by providing technical and historical content based on experience in CSO management and permit compliance, and management of the City's stormwater and sanitary sewer system infrastructure. This program supports the efforts the Phase 2 program through community outreach and public education on the CSO problem, the City's plan to address it, and how residents and business owners can participate in the solution.

The communication plan helps in gaining acceptance and cooperation for the impending mandated rainleader disconnections that will result in expenses to property owners. The plan shall position maximum activity to highlight the introduction of the new rainleader ordinance and the start of the first property inspections under the ordinance. A multimedia approach will be used to raise awareness and provide guidance and referral information. CSO fact sheets (handouts) have been designed for specific audiences, and a City web site on CSO and the RDP is in development. A how-to-disconnect video and flyers, CSO media packets, and CSO displays are also scheduled for preparation prior to launching the RDP. Stakeholder meetings have begun as a method of introducing the rainleader ordinance and disseminating CSO information to targeted key business, neighborhood, governmental, and environmental groups.

Another important element of the communication plan is to include education directed at the general public to increase awareness on why stormwater management is a concern. Teaching property owners how to control the quantity and quality stormwater runoff will not only help reduce inflow and infiltration (I/I) to the sanitary sewer system, but will also reduce pollutant loadings to area lakes, rivers, and streams. Source controls on stormwater rates and pollutant discharges are simple and cost-effective ways to implement stormwater management, especially in comparison to utilizing large treatment facilities. Long-term, the public education tools and content created by the CSO communication plan shall be used to perpetuate continued water quality education efforts beyond the life of the program.

COMBINED SEWER OVERFLOW PROGRAM - PHASE 2 November 1, 2002

Additional Ongoing CSO Efforts

There are several other activities that are complementary to the Phase 2 program and have direct or indirect benefits to the goal of elimination of CSOs. Some of these activities have been expanded or have a CSO component added to them, such as the rainleader/private drain separation activities of Site Plan Review and for capital improvement projects by both the City and other entities. The latter initiative will be implemented as prioritized areas under the RDP. The Flood Mitigation Program has a secondary benefit of reducing the volume and duration of ponding water during and after rainstorms. This decreases the volume of floodwater entering the sanitary sewer system through manhole cover holes or other entry points. As part of the Phase 2 program, all these activities were reviewed to clarify responsibilities including delineation of tasks, communication and coordination, and reporting procedures. Project engineers, sewer maintenance staff, and other staff participating in these activities have been contacted and educated on their involvement in the overall CSO effort and advised of what resources are available to help them.

Sanitary System Maintenance:

- Continue inspections of infrastructure to determine needed repairs, annual pipe rehabilitation program to minimize infiltration, and complete repairs and bulkhead overflows to remove inflows.
- Continue replacing sanitary manhole covers w/more than one hole in ponding areas (approx. 700-800 replaced to date).
- Continue to study and then implement collection system management software to predict sewer deterioration and recommend inspection frequencies. This will improve sanitary sewer infrastructure condition and prevent emergency overflow events related to structural failures.

Minneapolis Capital Improvement Program Projects:

- Complete Flood Mitigation Program projects that will have benefit of reduced inflows/infiltration to sanitary system.
- Coordinate and complete CSO Area separation projects and rainleader/private drain separations as components of other scheduled capital improvement and public development projects.

Other Public/Private Projects and Developments:

- Identify and require rainleader/private drain disconnections through City's Site Plan Review process.
- Identify and coordinate rainleader/private drain disconnections for capital projects and developments by other governmental or public entities.

COMBINED SEWER OVERFLOW PROGRAM - PHASE 2

November 1, 2002

Schedule

Late 2002 - Early 2003

1) Adopt newly drafted rainleader ordinance.
2) Create CSO separation areas prioritized capital project list and cost estimates.
3) Prepare materials and audio-visual aids, publish web pages, and launch public education campaign.
4) Hire Rainleader Disconnection Program inspectors and additional engineering staff.

2003

1) Begin sanitary sewer system modeling study.
2) Expand public information campaign prior to first property inspections.
3) Begin Rainleader Disconnection Program property inspections.
4) Begin construction of prioritized capital separation area projects.
5) Continue ongoing sewer maintenance activities, Flood Mitigation Program, and CSO efforts through capital project coordination and Site Plan Reviews.

2004

1) Implement collection system management software for sanitary sewer maintenance operations planning.
2) Continue public education, Rainleader Disconnection Program, and capital separation projects construction.
3) Continue ongoing sewer maintenance activities, Flood Mitigation Program, and CSO efforts through capital project coordination and Site Plan Reviews.
4) Complete sanitary sewer system modeling study.

2005-2006

1) Begin implementation of improvements based on sanitary sewer system modeling study recommendations.
2) Continue public education, Rainleader Disconnection Program, and capital separation projects construction.
3) Continue ongoing sewer maintenance activities, Flood Mitigation Program, and CSO efforts through capital project coordination and Site Plan Reviews.

2007 & Future

- Complete capital projects and final RDP disconnections.
- Continue ongoing sewer maintenance activities and complete Flood Mitigation Program.
- Evaluate need to perform additional studies for off-line storage and conveyance facilities primarily based on compliance with NPDES CSO permit.

COMBINED SEWER OVERFLOW PROGRAM - PHASE 2

November 1, 2002

Costs

Cost estimates for the Phase 2 program have been at the budgetary level only. Estimates by the City and those presented in the CSOSEP report were based on many assumptions because no hard data was available. For example, the number of properties that will require rainleader/private drain disconnections will not be definitively known until inspections have been completed. Estimates of storm drains needed to accommodate disconnections needing new storm laterals were based on assumptions regarding type of buildings likely to require storm laterals and availability of storm drains nearby. Details were lacking on costs for known separation areas.

The strategy adopted to determine funding requests is due to this uncertainty regarding costs, especially for capital improvements, and also due to the City's present financial outlook. The approach to budgeting for the Phase 2 program shall be to request funds based on what is known that will be required at a minimum level in order to cover near-term needs, and then review and adjust funding requests on an annual basis. Budget requests were made in 2001 and 2002 for RDP and capital project technical staffing to begin in 2002; and for additional staff, capital improvements, and other program components to begin in 2003.

Combined Sewer Overflow Program - Phase 2 Funding (all amounts in 000's)[*]

	2002	2003	2004	2005	2006	2007	Subtotals
Rainleader Disconnection Program							
Staffing - Overhead	$290	$805	$805	$805	$805	$805	$4,315
Public Education	$60	$120	$120	$120	$120	$120	$660
Capital Improvement Projects							
Staffing - Overhead	$275	$325	$325	$325	$325	$325	$1,900
Project Design/Construction		$2,000	$2,000	$2,000	$2,000	$2,500	$10,500
Studies & Monitoring		$300	$50	$50	$50	$50	$500
Total Program Funding	$625	$3,550	$3,300	$3,300	$3,300	$3,800	$17,875

[*] Based on 2002 Budget (actual) and Mayor's 2003 Budget Recommendations. Because additional information and modeling studies are needed to fully understand potential costs, this budget does not represent all possible future funding levels.